Claims

1. A single valve for selectively providing either (a) flow of gas into and out of or (b) containment of gas within reactant gas flow fields of a fuel cell stack, said valve comprising:

a gas inlet path;

a gas outlet path;

a vane, disposed between said gas inlet path and said gas outlet path, which may be oriented in a first position or a second position, said second position being normal to said first position, said vane, when in said first position allowing flow of reactant gas from a source through said inlet path to the fuel cell stack and from the fuel cell stack through said outlet path to exhaust, and when in said second position blocking flow into and out of said fuel cell stack through said paths.

2. A valve according to claim 1, comprising:

four conduits interconnected at four apexes of a substantially orthogonal intersection;

said vane being within said intersection and capable of being disposed in said first position between a first pair of said apexes to interconnect a first one of said conduits with a second one of said conduits thereby forming said gas inlet path, and to interconnect a third one of said conduits with a fourth one of said conduits thereby forming said gas outlet path, said vane being capable of being disposed in said second position, normal to said first position, between a second pair of said apexes to interconnect said first one of said conduits with said fourth one of said conduits and to interconnect said second one of said conduits with said third one of said conduits, thereby blocking said flow into and out of said fuel cell stack through said paths.

3. A valve according to claim 1, comprising:

a gas inlet/outlet manifold having a gas flow path; and wherein:

said vane is disposed in said gas flow path, operable when in said first position to divide said gas flow path into said gas inlet path and said gas outlet path, and operable when in said second position to block said gas flow path.

4. A valve according to claim 1, comprising:

a gas inlet/outlet manifold having a divider to separate said inlet path from said outlet path so as to direct incoming gas into a first half of said fuel cell stack and to receive outgoing gas from a second half of said fuel cell stack; and wherein:

said vane is disposed in alignment with said divider when in said first position and is normal to said divider, thereby blocking said inlet path and said outlet path, when in said second position.

5. A valve according to claim 1 wherein:

said vane is transferred from one position to another by an active, electrically powered device.

6. A valve according to claim 1 wherein:

said vane is caused by a spring to assume said second position and is moved into said first position by gas flowing in said inlet path and said outlet path.